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Editorial

In recent years both medical people and laymen have closely examined the dynamics of the medical profession. The result of most studies has been the realization that the profession of medicine is changing as never before.

Generally, within our affluent society, the advancement of technical knowledge in all fields has progressed at such a rate that the social structure which supports it is unable to keep pace.

The medical profession shares in this problem. But the difficulties of rapid medical-technical advance are compounded by the fact that here, change is taking place within the confines of a group, traditionally resistant to the acceptance of "change" — for the art of medicine teaches conservatism.

In this edition of the Journal, attempts have been made to examine some areas that are presently in the process of rapid change. Concepts relating to the role of the doctor are philosophically discussed. This is followed by an account of services available to the physician and ways in which they are utilized; the viewpoint is that of the historian as well as that of the clinician. One area which concerns students directly, that is medical education, has had a full edition of the Journal devoted to it and is not discussed here. Finally the fascinating area of changing concepts of disease is looked at in an article entitled "What is Disease?"

The staff of the Journal is very much aware that any attempt to cover such a wide range of subject matter has to be cursory, but it is hoped that the articles may serve as an introduction to areas of medicine which are both topical and interesting.

D. A. K.

The Role Of The Doctor In The Community

By DICK JOHNSON '68

The characteristic features of the medical profession are determined to a large extent by the attitude of society towards the human body and by the valuation of health and disease. The scope of medicine was always the same, to cure disease and eventually to prevent it. Medicine always meant service; therefore at all times certain qualities were required of the physician — readiness to help, knowledge concerning the nature of disease, and skill in curing the sick man.

Henry E. Sigerist, M.D.

The Physician's Profession Through the Ages, M.D. Publications, New York, 1960, *p.* 3

INTRODUCTION

Medicine is entering a period in which "organization" and "service" seem destined to play a prominent and perhaps somewhat exaggerated role. The function of the physician can no longer be regarded as beginning and ending with the care of the physical needs of his patients. He has certain obligations or duties that he owes to his patients, his community, his profession and himself. These obligations might be subdivided into economic, social, political, and professional.

THE MEDICAL STUDENT

The Medical Student, who is, in effect, preparing himself for his role in the community as a doctor, should remember that although a sound medical education is essential, it is not, in itself, sufficient. In addition to being proficient in the art of medicine, the graduating doctor must have developed himself in other fields with a special emphasis on the liberal arts and humanities. He must not only be a highly skilled, well-trained practitioner but, as well, an educated member of the community, so that he can adequately communicate with his patients and other members of society.

The graduate doctor today is entering a community that is extremely sophisticated. If he wishes to maintain his position of high respect and regard in this community, he must have the support of an education that can be received only outside the classroom and laboratory or clinic. The young neophyte, otherwise, will emerge from his cocoon and find that while he has been undergoing his metamorphosis in the void of four years of Medical School, the world has passed him by and he is no longer familiar with his surroundings. If the student buries himself entirely in his books and does not allow other facets of his personality to develop, he will surely find himself inadequately equipped to accept a position of leadership within the community.

THE MEDICAL PRACTITIONER

Professional Obligations

A doctor, whether he is a general practitioner, or a specialist, has certain obligations to his profession. In order to retain an adequate knowledge of his field the practitioner today has to spend more time than ever before doing outside reading and taking "refresher" courses. The doctor at the turn of the century had little respect for current medical literature and relied

instead on concise definite medical texts. Most of his reading would be directly related to a current case. Today, however, the physician is overwhelmed with journals, symposia, and therapeutic magazines and it becomes his obligation to assign a certain amount of his time either each day or each week to the reading of those articles that are relevant to his own particular practice. Medicine is so rapidly advancing that a graduate of today can expect a half life of ten years with regard to his approach to diagnostic and therapeutic medicine if he does not remain abreast of current developments by every means at his disposal.

The question of specialization is currently a much discussed problem. Can a physician best serve the public as a general practitioner or as a specialist? Research in "basic sciences" (anatomy, embryology, physiology, biochemistry, and bacteriology) as well as an increased complexity of the clinical sciences have so extended knowledge of disease processes that it becomes increasingly difficult for an individual to acquire an intimate knowledge of all fields of Medicine. It is essential, therefore, that we have specialists. To serve the community best, it becomes necessary for certain graduate doctors to spend additional years to better equip themselves for a specialty in which they have a particular interest. At the same time, however, this definitely does not eliminate the need for the general practitioner.

The general practitioner is the front line of medicine as he is usually the first contact that the patient has with the profession. He must, therefore, be able to treat him, if possible, and, if necessary, refer him to the appropriate specialist. To fulfill his role adequately the general practitioner must have a good liaison with his fellows in the profession and be willing to refer a patient when it will be to the patient's benefit.

The doctor also has certain ethical obligations to his profession, his patients, and their families. With the exception of the interpersonal relationship that exists within one's own family, or with the family minister, there is no bond that is closer than that between physician and patient. Any departure of a Doctor from a rigid code of ethics weakens this bond not merely on an individual basis but more likely with regard to the entire profession-community relationship. It is this relationship rather than the doctor-patient relationship that has recently suffered the most. When the public reads an overemphasized account of a doctor's misjudgement or misconduct, it is not only that individual that suffers but the profession as a whole. In this enlightened era the public can be led easily by newspaper reports to the extent that a strong tide of resentment against all medical personnel can be fostered.

Medical students, alike, are not immune to this public feeling. Unfortunately, too often, single, isolated events can reflect upon an entire student body giving the public the concept that medical students are wild, depraved, pleasure-seeking creatures with minds that have sunk to the lowest ebb. Granted this is an incorrect concept in most instances, but each student should realize that his actions can not only brand him for later life but, in addition, they might be extremely detrimental to the image to which the Medical Profession aspires.

Social Obligations

In former years the doctor has always been considered to be the pillar of the social community. It was to him, because of his education and their respect for him, that the community would turn for leadership. Even today a doctor cannot isolate himself from his community and its needs. They expect him to take an active role in youth programs, church affairs, and community organizations. He should attempt to allocate a certain amount of his time to the social needs of the community both as a leader and as a participant.

One might again, at this point, mention the practitioner's role relative to his patient and the patient's family. Because of his position of esteem, the physician must expect to be called upon to act in an advisory capacity. This trust should not be belied. He is ethically bound not to reveal any of the details of a consultation. To break this trust would be to destroy the main doctor - patient relationship.

A social obligation that is not stressed too often is that which a doctor owes to his own family, not on a professional level, but in the role of husband and father. It is unfortunate when any person becomes so preoccupied with his own affairs and problems that he neglects those who need him the most. To deprive his family of adequate time can lead only to domestic problems which, in turn, can affect his professional life, his position in the community, and the future welfare of his wife and children.

Economic Obligations

The doctor, because of his financial status finds himself, at times unwillingly, playing a prominent economic role at both the community and national levels. Charities, community fund raising campaigns, churches and schools all fix their sights on the doctor as a prime target in their fund raising. Contrary to some criticism donations to charities by the doctor are reasonable. Since the medical profession, as such, is a small group, donations should be calculated on a per capita basis. If this method is used rather than a general total profession donation, the medical profession rates equal to other similar groups. Donations are not, however, limited entirely to cash. It is expected of the Doctor that he will give a certain amount of his time either professionally or otherwise to the community. This generally is in the form of aid to those who cannot afford medical services or to the general betterment of the community.

The income of a doctor puts him in the position, as well, of being able to make a sizeable contribution to the government in taxes each year. This happy, good-natured donation by each practitioner is one of his definite economic obligations.

Political Obligations

There should be no obligation, despite criticism to the contrary, for a practising physician to take an active role in politics other than on a minor local level. An entry into provincial or federal politics becomes incompatible with a Doctor's obligations to his patients. To devote the necessary time to politics he would have to forego any additional study in his own field thereby cutting short his own interests. Also, unlike a lawyer, a physician cannot direct his practice by correspondence from parliament. The two are such that they cannot be combined. No practice can thrive or perform an adequate service if the doctor is not available when he is needed. This does not eliminate a doctor's participation in local or organizational politics, but even this should be left to the individual physician's discretion.

CONCLUSION

Thus we have embodied and immortalized the ideal physician as one who is competent and qualified in the technical aspects of his work, yet at the same time is able to fulfill certain other necessary obligations within the community. In the application of his skills he has certain rights, such as a complete and confidential access to a patient's personal and physical history. In return he is obligated to record this with restraint. His treatment must be without self-interest and must emphasize the welfare of the patient and the community. It is this conceptual role of the doctor that should guide his own conduct and that of his fellows.

I would like to thank Dr. Andrew Hunter for his aid in the preparation of this article.

THE CONTRIBUTIONS OF ANCILLARY MEDICAL SERVICES

By MARVIN WEISLER '66

INTRODUCTION

At the present time we are witnessing the amassment of the most precise body of medical knowledge ever recorded. The medical doctor today is astute in the prevention, diagnosis, and treatment of disease not only because of research contributions by the medical profession, but also as a result of contributions, in many forms, by those in paramedical fields. This article intends to review some of the developmental milestones in the history of those paramedical services most closely associated with clinical medical practice. It further intends to indicate their important role in competent, total, care of the patient.

In discussing this topic, the writer would view "treatment" in its broadest sense, to include not only care of the specific physical lesion or acute attack, but also rehabilitation, under the subheadings: physical, social, psychological, and economic. North American medical practice is the ideal model since the productivity, economic status, scientific and technological advances, control of communicable diseases, and even governmental system, are developed to the degree that the inhabitants of this continent now can receive a highly refined standard of medical care; one that is also able to devote time and effort to prevention and rehabilitation, rather than just to the urgent need to diagnose and treat disease.

The services of public health, physical medicine, and social agencies, add the refining touch necessary to make medical practice on this continent "total care".

Some limits need be set on the scope of this discussion, since many disciplines have added to medical knowledge. Emphasis shall be placed on those disciplines which have contributed heavily to progress of clinical medical practice rather than to research per se. These are:

1. Bacteriology and immunology
2. Pharmacology and therapeutics
3. Clinical chemistry
4. Diagnostic radiology
5. Public health and social services.

1. BACTERIOLOGY AND IMMUNOLOGY:

The science of bacteriology had modest beginnings. Disease was thought to be caused by evil spirits and vague chemical vapors. Treatment was equally unsophisticated, consisting largely of the application of leeches, trephining, and later, venisection. In early 19th century America, the use of healing agents was still empirical.

The emergence and clarification of thought in this science resulted from the work of such people as Leeuwenhoek, Koch, Lister, Jenner, and Pasteur. The years between 1877 and 1897 were ones of great revelation. Pasteur had been directing his attention to the phenomenon of immunity, known since Jenner's time. This provided a rational basis on which to build a real knowledge. Pasteur's research had a profound practical impact on the creation of a scientific public health program at the beginning of the 20th century.

Research flourished on the basis of these and other advances. Preventive vaccines were developed; passive immunization was employed; the role of vectors or intermediaries in transmission of disease was defined; and in recent times immunology and virology have come to the forefront, due to the work of such people as Salk, and Sabin.

In terms of clinical medicine, the practitioner now possessed an important tool. However, until the development of sulfonamides in the 1930's and antibiotics in the 1940's, specific treatment of bacterial diseases was limited and symptomatic. Nowadays, the services of the clinical bacteriology laboratory are a matter of course. Public health laboratories were also a practical outcome of the earlier research. This provides even the out-of-town physician with service, by mail. This aspect has been aided by the development of better transport media, which insure the preservation of the organisms.

Immunologic techniques have provided many diagnostic tests on which we rely; the Brevindex, Coombs anti-globulin, tests for Rh factor, grouping and cross-matching of blood, antibody titres, are but a few of those which are indispensable in competent medical care. Specific treatment has therefore improved, and there is no need to rely on chance - effectiveness of "buckshot therapy". Sensitivity to specific drugs is tested as a matter of routine.

2. PHARMACOLOGY AND THERAPEUTICS:

The consequences of the application of bacteriological and immunological knowledge were further intensified by advances in chemotherapy. This subject was new in 1913, but soon firmly established its influence. The earlier state of affairs had led Oliver Wendell Holmes to remark that: "If the whole materia medica as now used, could be sunk to the bottom of the sea it would be all the better for mankind, — and all the worse for the fishes."[7]

The early pharmacological advances were in the main achieved in the laboratories of the pharmaceutical firms rather than in university departments. Foremost in this regard was Bayer.

The dye-linked sulfonamide "Prontosil" was produced by the Bayer organization, and its use led to the conquest of streptococcal infections. Puerperal fever, streptococcal septicemia, and acute otitis media, all commonplace in 1935, had a year later been so controlled as to shrink to the status of minor ailments. In 1938 sulfapyridine sounded the death knell of the pneumococcus, and the great killer of the aged, lobar pneumonia, was at long last curable by a drug. The sulfonamides which followed brought a large number of septic diseases under control. This success was greatly reinforced by Fleming's discovery of penicillin, which started the era of antibiotics; of "wonder drugs", which enabled the practitioner to feel at last a sense of mastery over infection and infectious diseases. Both the achievements and abuses of this chemotherapy, however, are well known to us all.

Although the economic interests of the drug companies are evident, they have worked in close association with, and in consideration of the needs of, the practising physician. The academic centres have also done this, but they remain more concerned with the pharmaco-physiology involved, thereby elucidating underlying principles, which the drug company laboratories amplify.

Thus, the physician has at his command a plethora of pharmaceuticals, and it is his duty, and often plight, to choose. The contributions of pharmacology are impressively evident, and not only related to specific therapy. For example, anaesthesia has expanded its abilities coincident with the development of this science.

3. CLINICAL CHEMISTRY

Another ancillary service without which the present day doctor could not function efficiently is that of the clinical chemistry laboratory. Obviously, clinical chemistry could not come into being, except in a very rudimentary form, until the sciences on which it is founded — biochemistry and physiology — had developed to the point that the results of the analysis of biological fluids and materials could be interpreted in terms of the underlying metabolic processes and their aberrations in disease. That, in effect, means that clinical chemistry could not really develop much before the first decade of the present century.

The forerunners of the modern clinical chemist had at their disposal many well-authenticated facts and even a number of crude and inconvenient methods of analysis.

The growth of clinical chemistry has been aided also by great improvements in the instruments available. The aims have been principally to increase sensitivity and so to make possible the use of smaller amounts of material for each analysis; to ensure maximal reproducibility; and to make methods as nearly specific as possible. Nowadays micro-techniques allow analyses to be done not on milliliters of blood, but on from 1 to 5 drops. Speed of analysis is yet another goal.

The introduction of the flame photometer for plasma sodium and potassium determination; urine testing devices such as the "Clinistix"; chromatography; spectrophotometry, and the "Auto-Analyzer", all enable the physician to obtain rapid and specific information on the chemical state of his patient, so that accurate therapy can be begun. Recently, new horizons are visualized, by work on enzyme and hormone assays.

4. DIAGNOSTIC RADIOLOGY:

Another ancillary specialty, invaluable to the practitioner, is that of diagnostic radiology. There are still those amongst us who have a memory of the developmental history of this science, whereas today the routine reliance of the practitioner on this diagnostic aid, is obvious.

The apparatus available in the early days was probably the greatest limiting factor in the development of radiology. During the first 15 years, the apparatus and tubes were of such fragile construction and unreliable performance that much of the operator's time and ingenuity were required to produce even reasonably satisfactory results. The Coolidge tube came into use about 1913, and this marked the beginning of modern technique. Various other improvements, such as: the closed core A.C. transformer; the designing of the grid by Potter; shock-proof tubes; improved films and processing; cineradiology; and image intensification, to mention but a few, were great forward strides.

Not only did improved technique enable better viewing of structures, but important contributions were made in metabolic diseases, growth, dynamics of bone, branchiectasis, classification of congenital bone diseases, and many other areas of practical and academic interest. Such studies have given radiology an independent status.

Many refinements have added brilliant pages to the history of this science. The increasing use of contrast media has probably had more influence on diagnostic radiology than any other factor during the past 50 years. In the earliest years following Roentgen's discovery, the prevalent opinion was that the usefulness of X-rays would be limited to the study of the skeletal systems and the location of foreign bodies. These limits were soon surpassed to the point that today this is a highly refined diagnostic tool, the subtleties of which can still surprise experienced practitioners, and the services of which are in constant, routine use.

In the realm of treatment, therapeutic radiology has been a valuable addition, though it will not be discussed in this article.

5. PUBLIC HEALTH AND SOCIAL SERVICES:

A practical outcome of the advances in bacteriology and immunology was the establishment of public health services. Through a series of boards, bureaus, and conferences, which met as early as 1831, but were not really effective until about 1907, the World Health Organization was eventually established. The first Director-General of it was Dr. Brock Chisholm, Canada's Deputy Minister of National Health.

The world Health Organization fulfills the following functions:

(1) The world's directing and coordinating authority on all international health work,
(2) The world's clearing house for information, medical and scientific,
(3) Promotes and conducts research in the health field,
(4) Administers international aspects of sanitary regulations governing world wide traffic by land, sea, and air.
(5) Assists governments to fight disease and strengthen their health services.

This international body seems remote from the individual practitioner. However, this is not true, as the effects of W.H.O. policy and research are widespread, and for certain prescribed diseases report is made by the national health authorities, to it.

In Canada, the individual practitioner works with the assistance and cooperation of: federal public health administration, in the form of the Department of National Health and Welfare; the Provincial Department of Health; local public health units; and voluntary health organizations. The Department of National Health and Welfare was established in 1919, and administers various acts, governing such problems as: narcotics control; food and drug directorate; quarantine, immigration medical and sick mariners services; Public Works Health Act — regarding living conditions; and a host of other services ranging from technical assistance and consultation to national health grants and to health research and statistics.

The Provincial Departments of Health provide both preventive and therapeutic services, each being subdivided into four categories:

(1) Directional
(2) Consultative
(3) Educational
(4) Direct Services - such as central laboratories, diagnostic clinics, distribution of free biological products, and provision for treatment of major health problems.

Local public health units consist of a medical officer of health, sanitary inspectors, public health nurses, and a variety of other personnel, including: dentists, veterinarians, and public health educators. The function is:

A. By legislation;
   (1) Communicable disease control
   (2) Environmental sanitation.

B. "By custom";
   (1) maternal health
   (2) infant health
   (3) preschool health clinics
   (4) school health services
   (5) public health nursing
   (6) mental health clinics
   (7) vital statistics
   (8) adult health services
   (9) education
   (10) others - geriatrics
   accident prevention, etc.

C. Association and cooperation with voluntary health organizations - such as: St. John Ambulance; Canadian Red Cross; V.O.N.; C.N.I.B.; and so on.

D. Association with other municipal departments where liaison is important; for example, the Building Department.

The practitioner, therefore, has the assistance of an efficient complex of services which enable his patients to benefit from a progressive, thorough program of disease prevention and screening. In addition, clinical samples will be analysed, cultures grown, and advice given, on request, and largely free of charge. A major portion of the work of these departments is subtle, and goes unnoticed by the public, yet is effective in maintaining a healthy population. While he benefits from such services, the practitioner must also work to perpetuate their efforts in order that control does not break down.

A final ancillary service to be briefly mentioned is that of social agencies within the community. One only need study the history of a person or family afflicted with chronic disease or disability, to realize that socal, economic, and/or psychological rehabilitation, as well as physical recovery, are essential to maintain a healthy society. Social services provide any form of assistance from direct financial aid to advice and counselling. These are provided by federal, provincial, municipal, and private agencies, and include such assistance as: Employment Service for Handicapped Persons; Mother's Allowance; Disabled Person's Allowance; Welfare Payments; School for Deaf and Blind; Family Service Bureaux; Child Welfare Associations; Victorian Order of Nurses; Societies for Crippled Children; Legal Aid; Service Clubs; and many others.

The social services and public health organizations not only provide a great service to the individual patient, but also lessen the load on the individual doctor in completing his care of the patient. Social services in particular are indicative of a relatively affluent society which is democratic - enough to cherish the value of each of its members.

But, even amongst the splendor of magnificent medical advances, there are pitfalls. The abuse of penicillin in its early years is a well known example, though it was done, often, with well-meaning enthusiasm. We now possess unparalleled aids with which to practise our profession. These, our earlier counterparts had not. But many of them did exhibit great skill in eliciting physical signs and interpreting symptoms. Often today we are in danger of arriving at a "laboratory diagnosis", a "chemical diagnosis" or a "radiological diagnosis", and disregarding our own clinical impressions. Let us remember there is still room for the "art of medicine" in the practice of medicine, in terms of judgement, astuteness, and experience.

The author would like to acknowledge, with thanks, the guidance provided by Dr. Carol Buck in the writing of some parts of this article.

REFERENCES

1. Burn, H. J.: *Pharmacology 1913 - 1963,* Medical World, London, 99:280 - 284, Aug. 1963.
2. Coburn, J. B.: *Public Health Administration.*
3. Department of Preventive Medicine and Psychiatry, University of Western Ontario: *Social Agencies Available Within the Community.*
4. Doub, H. P.: *Radiology in this Century,* Illinois Med. J., 124:441-444, Nov. 1963.
5. Douthwaite, A. H.: *Developments in Medicine in the Last Half-Century,* Medical World, London, 99:275-279, Aug. 1963.
6. Hanlon J. J.: *Principles of Public Health Administration* ed. 4, St. Louis, 1964, The C. V. Mosby Company.
7. Holmes, O. W.: *Writings IX; Medical Essays,* Boston, 1891, Houghton Mifflin & Co., in: *Principles of Public Health Administration,* J. J. Hanlon, ed. 4, St. Louis, 1964, The C. V. Mosby Co.
8. Rosen, G.: *The Bacteriological, Immunologic, and Chemotherapeutic Period, 1875 - 1950,* Bull, N.Y. Acad. Med., 40: 483-494, June 1964.
9. Rosen G.: *Provision of Medical Care - History, Sociology, Innovation,* Pub. Health Rep., 74:199 March 1959.
10. Stewart C. P.: *The Development of Clinical Chemistry,* Clin. Chem. 10: 268-276, March 1964.

B.Sc. Phm. - - - ICE CREAM SALESMAN?

By ELIZABETH MUSCLOW, '66

INTRODUCTION

What is happening to Pharmacy these days? Are Pharmacists getting rich quick? Why do drugs cost so much? Why do Drug Stores sell ice cream cones? The answer to these and other questions was found recently when I talked with a Pharmacist friend of mine. He has practised his profession in retail pharmacy, in the hospital dispensary and in discount pharmacy. With this varied experience my friend proved to be an informed critic of the trend in Pharmacy today.

THE RETAIL PHARMACY:

Today many of the retail Pharmacies look like a Variety Store featuring everything from ice cream cones to French perfume. The prescription service seems to be a sideline. The reason cited for this array of products is that the prescription service is not enough to keep the business solvent, and these other items attract the customers. Where is the logic of this? Having a prescription service requires the full-time employment of a licensed pharmacist. By virtue of his University education and the responsibility that he assumes, his salary is high and rightly so, but in today's drug store this high-priced help is spending a good part of his time selling bobby pins and licorice — a job easily handled by a teenager after school at a fraction of the salary. It would seem to be more prudent to enlarge the Pharmacy line of the business and put the Pharmacist to work at the job he likes best. Apparently there are a few such enterprises established in Toronto (and probably elsewhere also) which are devoted entirely to medical dispensing to the public and succeeding financially.

THE DISCOUNT PHARMACY:

By law every drug store must be owned by a licensed Pharmacist. Consequently the Discount Store pharmacy department is really an independent unit. A licensed man sets up the department in the Discount Store and pays the equivalent of rent by turning over to the Store a prearranged percentage of his gross income. He can sell at a price less than the retail price because of bulk buying, because he sells for less than the retail list price (which has a mark up to approximately 40%) and because he is engaged solely in the administration of the pharmacy service.

This is the arrangement in most Discount Drug Departments, but there are a few centers which are peculiar in that a licensed man does not own the pharmacy. This is allowed because prior to the passing of the above mentioned law defining ownership, drug stores could be operated by anyone who obtained a government charter. A few such charters have come into the hands of businessmen who have in turn hired licensed pharmacists to dispense, but the running of the business lies exclusively in the hands of the "lay-owner". Because of this their scheme of management is not entirely ethical to their fellow pharmacies.

However, it is an assured fact that the drugs dispensed by all types of pharmacies are of the same high standard of quality.

COSTS:

"The national survey of 223,000 prescriptions sponsored by the Canadian Pharmaceutical Association in November, 1964 gave the average price of a prescription as $3.47." But of these 64.4% were

dispensed below $3.47 and the average price of this 64.4% group was only $2.28. "The average cost of these . . . prescriptions was $0.98 leaving $1.30 as gross margin. The 'Survey' shows the average cost of dispensing a prescription in Canada in 1964 to be $1.20. Hence for the thrill, love, joy, and legal responsibility of dispensing 143,583 prescriptions the pharmacist received an average profit of just TEN CENTS. The services rendered by the pharmacist in dispensing and/or compounding a prescription are of a professional nature, requiring specialized knowledge and judgment and the assumption of legal responsibility and the reward he gets for his services is therefore a fee." But can a profit of ten cents on the average be considered a fee in our standard of accounting? Therefore it would seem drug costs are not unduly high.

The cost of a drug to the consumer depends on two things. Firstly, a doctor who prescribes by trade name is costing his patient more than the doctor who prescribes by the generic name. Secondly, the real difference in price rests with the pharmacist. He may run his business on many dispensing fee systems. He may choose to charge drug cost price plus professional fee, or retail list price plus a small service fee, or retail list price less a discount. The choice rests with the pharmacist when he first opens his business, and he may not change it once it is established.

For example: If a drug costs $3.00 and the professional fee is $2.00, the consumer pays $5.00. Similarly if he uses the retail list price of $4.20 and a small service fee, the consumer still pays about $5.00.

Also if a doctor orders a non-prescription drug on a prescription form, the druggist is entitled to his dispensing fee for filling that prescription. This obviously influences the price the consumer pays.

BIG BUSINESS AND BRAINWASHING:

Pharmaceutical manufacturers are big business today. They are essential to our society because it is through their efforts that massive and life-saving research is being done to perfect the old drugs and discover new ones. Synthetic medicines are in such quantity now that no one need go untreated because of restricted supply. These companies have exacting laboratories that can prepare drugs of high potency with rigid standards of quality control.

In order to advertise effectively these large companies bombard every doctor's office with their propaganda and their drug salesmen. In effect it is almost a legalized and subtle brainwashing of the medics. On the whole a Practitioner is too busy to investigate every drug and the claims made for it in the reems of literature on the clinical trials. He must rely to a large extent on the recommendation of the drug representative that his company has the best drug for disease "X". Consequently, doctors the province over almost automatically write that brand name on the prescription pad the next time a patient presents at his office with disease "X". It has been estimated that for every dollar put into the research of a new drug, three dollars are spent on promoting it.

THE FUTURE:

What did my friend the Pharmacist see in the future for Pharmacy? He commented on status, working hours, remuneration and some constructive thoughts.

The status of the hospital pharmacist is excellent. He acts in a professional capacity as a consultant to the doctors and interns on medications. He is often involved in the instruction of the student nurses. And in some instances he is even actively engaged in manufacturing large amounts of medicines to be used within the hospital. The status of the industrial pharmacist and the government health organization's

pharmacists is also good and his working conditions and fringe benefits are desirable. The status of the retail pharmacist is in many cases deteriorating in the eyes of the public as "The fellow with a university degree dispensing ice cream cones". This may result in decreasing the number of pharmacies in the city, yet all of them will then probably become better equipped to serve the public's prescription needs.

A retail pharmacist, especially if he is an owner-pharmacist spends much more than 40 hours a week. Some estimate that they work as much as 70 hours a week. The pharmacists employed in industry or research have much better working hours.

In retail pharmacy the average hourly rate for a licensed pharmacist is between $3.00 and $4.00. Compared to a plumber, auto mechanic or brick layer, it is quite a pathetic wage for a professional man with a four year university education to say nothing of the immense responsibility that is his in dispensing. In fact, some hospital pharmacists are grossing as little as $6,000.00 a year. On the average the pharmacist is obtaining less than $10,000 a year when all types of employment for him are considered. Some smart retail-owner pharmacists may have an income as high as $15,000.00 a year, however, if you consider their investment plus the long hours and risks, you might see that it would be wiser for them to invest their money in mutual funds and work for someone else.

My friend suggested that the pay schedule for hospital pharmacists and industrial pharmacists should be brought into line with other professional people such as the engineers or school principals. For the retail pharmacist the ultimate goal should be to raise the status of the profession by establishing an excellent prescription service and definitely no ice cream cones.

REFERENCES:

1. My friend, the Pharmacist
2. Bulletin of the Ontario College of Pharmacy, January, 1966.

WHAT IS DISEASE?

By EMILIE NEWELL '66

INTRODUCTION

Since the beginning of time, Man has been beset by various ills and ailments. How he explained them has been the sum result of his religious beliefs, his technological skill, and his knowledge in other sciences. His treatment has been based on the theory that he subscribed to. This essay will briefly outline those concepts of disease which have been the most prominent through the years. The approach used is a modified one of that suggested by A. E. Rodin.[1]

DEMONIACAL APPROACH

From prehistoric to classical Greek times, men thought the earth and heavens to be inhabited by beings similar to himself but more powerful; as they pleased, these beings could send disease or cures into men. Nothing except propitiation of the angry god or supplication to a more powerful god, could be done by men to affect the course of any disease.

HUMORAL APPROACH

The humoral theory of disease could be said to have been invented by Hippocrates and perpetuated by Galen, in that the latter's works were assiduously studied by scholars in Classical Greek times up to but excluding the Middle Ages. The theory was based on Hippocrates' many careful observations of patients and the obvious changes in their bodily fluids, e.g. the copious nasal discharge of a cold. And so he hypothesized the presence of four humors —blood, phlegm, yellow bile, black bile— all of which were supposed to be distinct from each other and irreducible. In the healthy person, he said, "the constituent substances are in the correct proportion to each other, both in strength and quantity, and are well-mixed."[3] Pain or other symptoms resulted when one humor was either deficient or in excess, or was not mixed with the other humors. Thus in the course of any disease, Nature tried to re-establish the balance of humors by eliminating the excess. A physician by his treatment should attempt to aid Nature; blood-letting therefore came to be a rational means of curing disease. Drugs were still used empirically and their effects on humoral balance carefully watched.

Two hundred years later in the second century B.C., Galen still subscribed to Hippocrates' humoral theory of disease and his theory of the four qualities (which I have not mentioned here because Hippocrates described them only as abstract causative principles of disease), but he attempted to unify these hypotheses into a broad concept of purposive interaction. To do this, he made observations, as did Hippocrates—but he sought for similarities and analogous relationships; and when he saw them, he assumed similar functions which were presided over by three pneumata or spirits: natural, vital and animal. Another part of his theory involved the four basic qualities—the hot and the cold, the moist and the dry. As the organs of the body functioned, they altered various substances into the qualities appropriate to the part involved, and reciprocally, the way in which the four qualities were blended, determined the activity of the body.

In summary, Galen introduced many concepts such as his "faculties" which seem nebulous to us today but he did recognize the influences of body parts, the whole organism, and the entire environment on

each other. This, I think, should be recognized as his contribution to modern medicine. The rest of his work was an attempt to present the world with a philosophy of purposeful function and relationships and as such, served to organize the knowledge of his time into a reasonable system.

ASTROLOGICAL APPROACH

The fifteenth and sixteenth centuries were characterized by a tremendous interest in the heavens, and particularly the movements of the stars and planets. These were thought to be so significant as to govern man's personality, actions and state of health. As an example of that type of thinking, Paracelsus' theories (1493-1541) will be discussed briefly. The cornerstone of his philosophy was the belief that all knowledge and wisdom came from God and that Nature was rooted in and depended directly on God. Medicine, the study of health and disease, was intimately involved with Nature and so, to know medicine, one must know Nature viz. things of the earth and of the heavens—not only some, but all things. And the learning must be done by direct experience. The stars influenced Man and nature, not by determining whether things happened, but how they happened; they were the source of qualities and activities, and the atmosphere (what Paracelsus called the "Mysterium") was the transmitter. I presume that God was then thought to be the final determinant.

His thoughts on medicine and disease were many and varied, some being quite inconsistent with each other. Again, astrology played a prominent role—each part of the body was supposed to be controlled by a separate planet, and if medicines were to be of use, the planet had to be favourable. He did not elaborate on the actual mechanism of this relationship. Hippocrates' humoral theory of disease was rejected by Paracelsus; he believed that the humors were manifestations of disease, and not the causes of disease.

To summarize, Paracelsus was mainly a philosopher who tried to understand the universe and its effect on earthly events; as such, he was typical of one type of fifteenth and early sixteenth century scholar.

OBSERVATION AND EXPERIMENTATION

During the Renaissance, accurate observation, precision, empiricism, and reason were emphasized as being the only ways of discovering the true facts. Any principle that could not be clearly demonstrated, had to be rejected. Then starting in the seventeenth century and gaining momentum in the eighteenth, experimentation was added to observation, producing the modern scientific method. As applied to medicine, it started the acceptance, legally and morally, of cadaver dissection as being the rational way of learning human atatomy. It had been practised sporadically and secretly prior to the sixteenth century, and then it became the main source of medical information. Vesalius was the foremost anatomist of the sixteenth century and published his findings in the monumental *De Humanis Corporis Fabrica.* It is not within the scope of this article to detail his work; suffice it to say that he corrected many of Galen's teachings, but unfortunately also perpetuated some misconceptions.

In the next two centuries, there were many investigators of human anatomy and physiology. All of the correlated clinical findings with necropsy changes and many of their names are still applied to clinicopathological syndromes — *Morgagni, Bright, Addison, Hodgkin, Banti.* Their contributions did not extend to theories of disease, except to deny "faculties" or "hidden powers" as causes, and advocate a mechanistic attitude toward disease.

As observational techniques became more refined, so did the concept of organ pathology become refined to that of tissue pathology, and finally with Virchow, to that of cell pathology. This process could be said to have begun with Robert Hooke in 1665 when he described the structure of petrified wood, charcoal and cork in terms of the "cell" i.e. "a space surrounded by a boundary wall". The next great step was taken by Schwann (1810-1882) when he demonstrated similarity between plant and animal cells, and between all animal cells. On that basis, he propounded his theory on the structure and development of cells in the animal economy viz. "There is one universal principle of development for the elementary parts of organisms, however different, and that principle is the formulation of the cells."[3]

The germ theory of disease causation was a direct derivation of Schwann's cell theory; in fact, Schwann himself suggested it in 1836 when he showed that fermentation is caused by yeast, and hence putrefaction is caused by living bodies. Koch and Pasteur then proceeded to show that disease conditions in animals were caused by various bacteria. Since then, the germ theory has been proven many times over as being valid in the causation of certain diseases, but it has been realized in the twentieth century that bacteria are not the only factors. Immunity, genetic susceptibility and environmental factors both physical, mental and social, play an important role in the etiology of disease. Thus has evolved the theory of multiple causation viz. that disease is the interaction of the agent (physical, chemical or biological), the host, his environment, and stress or deprivation. Some diseases have been found to be predominantly deficiency states eg. the various vitamin deficiency states, hormone lack; there is even a condition in infants which is thought to be mainly due to emotional deprivation.[2]

Genetic susceptibility has been mentioned above. This aspect of disease had its seed in the work of Gregor Mendel, lay dormant for many years, and then started to grow in the early twentieth century. It was nourished by observations of the fine structure and finally the ultra-structure of cells; support was received from biochemical studies of tissue fluids. Most research in the last two decades points to a metabolic theory of disease, based on enzyme changes, which in turn may be caused by alterations of genetic structure at a molecular level.

SUMMARY

From the humoral theory to the molecular theory, is a long path which has only been made possible by better methods of observation and experimentation eg. electron microscopes, ultra-centrifuges. From this, it would seem that changes in concepts of disease have followed technological developments for finer discrimination.

Present-day research into disease etiology is mainly in the field of metabolism on a molecular level. If the trend continues, I would expect a purely physico-chemical explanation for disease.

BIBLIOGRAPHY

1. American Foundation (The), *Medical Research: A Midcentury Survey,* Little, Brown and Co., Boston, 1955.
2. Galdston, Iago, M.D., *Beyond the Germ Theory: The Roles of Deprivation and Stress in Health and Disease.* Health Education Council, New York, 1954.
3. King, Lester S., M.D., *The Growth of Medical Thought.* University of Chicago Press, Chicago, Illinois, 1963.
4. Rodin, A. E., *A Historical Survey of Disease Concepts,* Canad. Med. Ass. J. 87: 24-8, 21 Jul 62.

SCHIZOPHRENIA

By MARTIN L. THRONE '69

Current Studies on the Biological Basis for Schizophrenia Being Conducted in the Department of Pharmacology

It has perhaps become a truism by now that more than half the hospital beds in North America are occupied by mental patients[6], roughly half of these being schizophrenics[3]. The nature and etiology of mental illness, especially the schizophrenias, remains unknown. Although great progress has been made in the maintenance therapy of these patients with the introduction of the various forms of shock treatment and the more recent use of chemotherapy, no treatment has yet been developed for the basic cause of the illness.

The idea that there is a chemical etiology of schizophrenia is certainly not a recent development. As early as 400 B.C. the Hippocratic School postulated the existence of a biological humoral factor, a psychotoxin, responsible for certain mental aberrations[4]. More recently interest in schizophrenia as a biological entity has been stimulated by two findings: the introduction of the psychotomimetic (hallucinogenic) drugs such as lysergic acid diethylamide (LSD) and mescaline, and the successful application of psychopharmacological agents in ameliorating the behavioral abnormalities associated with schizophrenia.

In 1956 a group under the direction of Heath in New Orleans, working on the comparative rates of oxidation of adrenaline by serum from chronic schizophrenics and "normal" subjects, isolated a fraction from the serum of schizophrenics which they claimed produced psychotic-like behavior when injected intravenously into monkeys[2]. It was later claimed that this factor, which was named "taraxein," produced similar effects in humans [2, 5]. Winter and Flataker reported in 1958[9] that plasma and serum samples from schizophrenic patients caused a decrease in the performance of rats trained to climb a rope for a food reward. Gowdey and Lovegrove, however, were unable to confirm these results[1].

Since the introduction of experimental psychological techniques to the field numerous attempts have been made to demonstrate the presence of a blood-borne psychotoxin in schizophrenics. The literature abounds with conflicting reports, so that the very existence of this type of factor has yet to be adequately demonstrated. The importance of such a finding is fairly obvious, for once the presence of an endogenous psychotoxin has been demonstrated the next step would be its isolation, with the hope of eventually being able to discover the steps which brought about the formation of the abnormal metabolite and to discover a means to prevent its formation and/or block its effects.

The purpose of the current research project in the psychopharmacology laboratory of the Department of Pharmacology has been to determine whether a specific blood-borne factor does exist in chronic schizophrenics which affects the behavior of rats. In this experiment two types of behavior have been studied: (1) the retention of a conditioned response; and (2) the learning of a conditioned avoidance response; and attempts have been made to control the numerous secondary variables which have plagued much of the previous work in this field.

For the first part of this study rats were trained in Skinner boxes to press a pedal for a food reward. A variable interval (VI) schedule, in which the animals were reinforced with a food reward on

an average of once every minute, was used to train the rats to a high, relatively constant level of performance. Once conditioned the rats were injected intraperitionally with 1.0 ml. of plasma from either a schizophrenic patient or apparently normal control subject, or with isotonic (0.9%) saline, and their rates of performance in the Skinner boxes after injection were compared to their pre-injection control rates.

In order to study the effects of plasma from schizophrenics on learning ability, naïve, young adult rats were injected intraperitioneally with 1.0 ml. of plasma from chronic schizophrenics or apparently normal subjects or with saline. The rate of acquisition of an avoidance task, in this case avoiding an electric shock applied to the animals' feet by crossing over a low barrier to a "safe" area, was then measured in a shuttle-type box. The stimulus to which the animal became conditioned was a buzzer sound. Learning was defined as the successful completion of six consecutive avoidances of shock (i.e. the rat responded to the buzzer and thus escaped before the shock came on).

The blood donors for this experiment came from two groups. The patients were all chronic male schizophrenics who had been in the DVA Westminster Hospital for over 10 years. All medication was withdrawn from this group at least two weeks prior to testing. The control, apparently normal subjects were drawn from the male orderlies at Westminster Hospital, and their ages were matched closely with those of the patients.

No differentiation could be made between the effects of "schizophrenic" and "normal" plasma on the two parameters of behavior studied. The animals injected with both types of plasma, however, responded at a decreased rate in the Skinner boxes, and were slower in learning the avoidance response than the group receiving saline. These experiments do not support the hypothesis of a toxic factor in the blood of schizophrenics which can affect the behavior of rats.

As recently as December, 1965 Dr. B. Brodie, Chief of the Laboratory of Chemical Pharmacology of the National Heart Institute, Bethesda, Md., was quoted as telling a meeting of the American Association for the Advancement of Science: "Despite a decade or more of biochemical investigation and a plethora of reported biochemical abnormalities, the fact remains that not a single biochemical defect in mental disease has been established[7]." Dr. T. Sourkes, of the Departments of Psychiatry and Biochemistry at McGill University, however, has added a more optimistic note when he stated, ". . . the findings of disturbances in somatic functions by biochemical means has positive value in showing that the psychoses are not purely psychological disturbances and in holding out the possibility of detecting larger physiological changes at some future date[8]."

BIBLIOGRAPHY

1. Gowdey, C. W. and Lovegrove, T. D.; Lack of differential effects of plasma from schizophrenic patients and normal subjects on performance of conditioned responses in rats. Canad. J. Psychiat. 1965. *In Press.*
2. Heath, R. G., Martens, S., Leach, B., Cohen, M. and Angel, C.; Effect on behavior in humans with the administration of taraxein. Amer. J. Psychiat. 114: 14-24, 1957.
3. Jackson, D. D.; Schizophrenia. Sci. Amer. *207*: 65-74, 1962.
4. Kety, S.; Biochemical theories of schizophrenia: Part 1. Science. *129*: 1528-1532, 1959.
5. Lief, H. I. The effect of taraxein on a patient in analysis. A.M.A. Arch. Neurol. Psychiat. 78: 624-627, 1957.
6. Rinkel, M. Chemical concepts of psychosis. New York: McDowell, Obolensky, 1958.
7. Schmeck, H. M.; The New York Times, Dec. 31, 1965.
8. Sourkes, T. L.; Biochemistry of mental disease. New York: Harper and Row, 1962.
9. Winter, C. A. and Flataker, L. Effect of blood plasma from psychotic patients upon performance of trained rats. A.M.A. Arch. Neurol. Psychiat. 80: 441-449, 1958.

Alumni News

Class of 1915

Dr. Herbert R. Baines, deceased.

Dr. Louis D. Chapman, deceased.

Dr. Rupert G. Doupe, deceased.

Dr. R. H. Fisher, deceased.

Dr. Wilfred J. Laurie, 325 St. Clemens Ave., Toronto 12, Ontario, did postgraduate work in Pathology at the Lovelace Clinic in Albuquerque, New Mexico.

Dr. I. J. Leatherdale, deceased.

Dr. R. Beattie Martin, deceased.

Dr. Geo. D. McTaggart, deceased.

Dr. Gerald H. Pearson, Apt. B-1023, The Presidential Apartments, Philadelphia, Pa. 19131, interned at the Ontario Hospital for the Insane, Mimico, Ontario. He obtained his D.Sc. (Medicine) in 1928 from the University of Pennsylvania, Philadelphia and is a Commonwealth Fellow in Neuropsychiatry, Diplomat, American Board of Neurology and Psychiatry, and Diplomat, American Board of Child Psychiatry. He was in the C.A.M.C. from 1916-1919. In the past, he has held the positions of Associate Professor of Child Psychiatry, Temple University Medical School, Philadelphia, and Dean, Institute of Philadelphia Association for Psychoanalysis. At present, he is Emeritus Professor of Child Psychiatry, Hahnemann Medical College and Hospital, Philadelphia and an Honorary Consultant, Institute of Pennsylvania Hospital, Philadelphia. He has written several books - "Emotional Disorders of Children", Psychoanalysis and the Education of the Child", "Adolescence and the Conflict of Generations" and is co-author with Dr. O. S. English of "Common Neuroses of Children and Adults" and "Emotional Problems of Living". He is married and has three children.

Dr. David E. Scott, deceased.

Dr. Wm. G. Siddall, deceased.

Dr. M. C. Sudworth, deceased.

Class of 1940

Dr. N. A. Alewick, 920 Duellette Ave., Windsor, Ontario, interned at Hotel Dieu Hospital, Windsor and is now in General Practice in this city.

Dr. B. C. Brown, c/o Dr. C. Y. Brown, 3480 Upper Terrace, Victoria, B.C., was with the R.C.A.M.C. and spent four years in service overseas. In 1958, he was a Teaching Fellow in Medicine at Westminster Hospital, London, Ontario.

Dr. E. L. Brown, 6 Scott St., St. Thomas, Ontario.

Dr. W. Harvey Clare, 36 Searle St., Hamilton, Ontario, served in the Second World War in the R.C.A.M.C. He is a Psychiatrist in Hamilton.

Dr. Clement Delit, 42-33 Kissena Blvd., Flushing 55, New York, U.S.A., interned at Brooklyn Cumberland Hospital, Brooklyn, New York. He is married and is practicing his specialty, Internal Medicine in Flushing, New York.

Dr. Ralph Diamond, deceased.

Dr. Murray Franklin, 4901 W. Jarvis, Skokie, Illinois, U.S.A., interned at Brooklyn Beth-el Hospital, Brooklyn, New York. He was in the U.S. Medical Corps during the Second World War and was awarded the Silver Medal. He did postgraduate work in Internal Medicine in Iowa and Illinois.

Dr. James D. Galloway, c/o St. Joseph's Hospital, Hamilton, Ontario, spent one year in the Department of Pathological Chemistry at Victoria Hospital, following graduation. He was overseas with the R.C.A.M.C. and spent approximately twenty years in the army. During some of this time, he was in the U.S. as a Canadian Liason Officer. In 1963, he received his Diploma in Hospital Administration from the University of Toronto and is now the Medical Director at St. Joseph's Hospital, Hamilton, Ontario.

Dr. Morton Golden, 36 Grace Centre, Brooklyn, New York, U.S.A., interned at Passaic General Hospital, New Jersey and did postgraduate work at the Brooklyn Neurological Institute. He is a diplomat of American Board of Psychiatry and has been in private practice as a Psychiatrist since 1947.

Dr. John E. Gompf, Box 409, Arthur, Ontario, interned at Hamilton General Hospital. He was the M.O. in No. 1 Canadian Special Hospital overseas in the Second World War. In 1964, he received a diploma in Public Health from School of Hygiene, University of Toronto and then joined the epidemiology branch of the Ontario Department of Health in Toronto.

Dr. Archie M. Johnson, 3390 W.44th St., Vancouver, B.C., interned and did postgraduate work in Internal Medicine at Vancouver General Hospital.

Dr. Harold Kester, 6476 Granville, Vancouver, B.C., interned at Hamilton General Hospital. He spent 4 years in the Air Force. In 1945, he did postgraduate work in Anaesthesia at Royal Victoria Hospital in Montreal and received a diploma in Anaesthesia from McGill University. He married Barbara Jones (A '39) and they have three children.

Dr. Jack Levine, 20 Plaza St., Brooklyn 17, New York, U.S.A., interned at Brooklyn Beth-el Hospital. He was with the U.S. Medical Corps for four years during which time he was in England, Africa and India. He is a Fellow of the American College of Surgeons, a diplomat of the American Board of Orthopaedic Surgery and a Fellow of the American Academy of Orthopaedic Surgery. He married Ester Quitt (N '40) and has four children.

Dr. Phelps Luria, 218 Broadway, Lawrence, Long Island, New York, interned at Harlem Hospital, New York. He did postgraduate work in Ear, Nose and Throat and Plastic Surgery at New York Hospital and at Queen's General Hospital in Jamaica. He is married and has four children.

Dr. J. F. Mullins, deceased.

Dr. Jack D. McInnes, 70 Cedar St., Sudbury, Ontario, received his F.R.C.S.(C) in Surgery in 1957.

Dr. John A. McLachlin, 10 Hillcrest, St. Thomas, Ontario, has his F.R.C.S. in Surgery. He was awarded the Research Gold Medal by the Royal College of Physicians and Surgeons. He was President of the St. Thomas Elgin Memorial Hospital Medical Staff in 1963.

Dr. Arthur A. Nareff, 260 East Broadway, New York 2, New York, U.S.A.

Dr. William Needham, 2567 Buckingham Drive, Windsor, Ontario is in General Practice in the same city.

Dr. Julien Priver, 3470 Cambridge Rd., Detroit, Michigan, interned at the U.S. Marine Hospital, Stapleton, Staten Island, New York. He did a residency in Hospital Administration, and was connected with the New York State Department of Health.

Dr. A. T. Roos, 1138 Hilltop Rd., Erie, Pennsylvania, interned at Hamot Hospital, Erie, Pennsylvania.

Dr. F. G. Ruston, 44 Beulah Ave., Hamilton, Ontario, interned at Hamilton General Hospital. He is presently an anaesthesist in the same Hospital.

Dr. Bernard J. Schumm, last known address 16 Laurel St W., Waterloo, Ontario.

Dr. Hyman D. Shapiro interned in St. Louis. While serving in the Second World War he was awarded the Silver Star of Honor, the Purple Heart, the Bronze Star, and two Presidential Citations. He did postgraduate work in E.N.T. at University Hospital, Ann Arbor. He is presently in practice in Lansing, Michigan.

Dr. Ken D. Symington, 4711 Coronation Drive, Calgary, Alberta, is a specialist in Diagnostic Radiology. He is married with four children.

Dr. William N. Watters, last known address was 53 St. Patrick St., Goderich, Ontario.

Dr. Eric Webb, University of Lagos Medical School, Private Mail Bag 12003, Lagos, Nigeria, interned at Toronto Western Hospital. He did a residency in Anaesthesia at Royal Victoria Hospital in Montreal and is on the staff at the University of Lagos Medical School.

Dr. Irving Weintraub, 1330 N.W. 13th St., P.O. Box 122, Gainesville, Florida, interned at St. Mary's Hospital, East St. Louis, Illinois. He was in Military Service 1941-1946 and 1950-1955, retiring as a Major. He received the Bronze Star and Cluster, Purple Heart and Cluster and the Invasion Arrowhead. He is in private practice with a specialty in Allergic Diseases.

Dr. Leo Zankan, 5452 Sadring, Woodland Hills, California.

Dr. W. R. Pridham, 140 St. David St., Mitchell, has been in General Practice in the same town since the 1930's.

Dr. F. J. Raffaele, 133 E. 58th St., New York, N.Y., interned at Brantford General Hospital. He is a Fellow of the American Board of Otolaryngology.

Dr. C. A. Rose, 11 Centre St., Hornell, New York.

Dr. F. L. Rose, 848 Dundas St., London, Ontario, interned at Victoria Hospital. He did postgraduate work at Montreal General Hospital and subsequently became a General Practitioner. He has four children, three of whom are Western graduates.

Dr. John E. Sharpe is the Superintendent of Toronto General Hospital. His daughter Mary Jane is a U.W.O. graduate.

Dr. John F. Simpson lives at 2101 Avenue Rd., Toronto, Ontario.

Mrs. Dorothy Smith (nee D. Snell) 107 Windsor Ave., London, Ontario, interned at Victoria Hospital.

Dr. W. R. Upthegrove, 1514 Main St., Suite 91, Saskatoon, Saskatchewan, interned at Hamilton General Hospital and is presently an Anaesthesist.

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Dr. Hyman Wilensky, 1017 Waterloo St., London, Ontario, interned at Victoria Hospital and did postgraduate training at Beck Memorial Sanatorium, London. He is Certified in Internal Medicine by the Royal College of Physicians and Surgeons and is a Fellow of the American College of Chest Physicians. He is married and has four children. One daughter graduated in Medicine at U.W.O. in 1962 and he has one son in third year Medicine, also at Western.

Class of 1960

Dr. Gail Alexander, Burn St., Mareeba, North Queensland, Australia, interned at Vancouver General Hospital and then served with the Air Division of the RCAF Canadian Armed Forces Overseas (CAPO). She married an Australian doctor, G. W. Mudell in 1964 while serving with the RCAF in Metz, France. They are now both practicing in Australia.

Dr. Francis E. Barnes, 7602 W. Dixon Rd., Milwaukee, Wisconsin, U.S.A., interned at Victoria Hospital, London, and did postgraduate training in surgery in the U.S. He married Gloria Varga (A '59) and they have three children.

Dr. James R. Brow, 3421 Grand Boulevard, Apt. #4, Notre Dame de Grace, Montreal, Quebec, interned at Victoria Hospital, London, and did postgraduate work both in London, Ontario and in Montreal in Internal Medicine. He received his F.R.C.P. (Internal Medicine) in 1965. He is married and has two children.

Dr. Thomas C. Brown, 28 Arbour Glen Cresc., London, Ontario, interned and is now doing postgraduate training in radiology at St. Joseph's Hospital, London. He is married and has one son.

Dr. John H. Buck, 103 Iverness Court, Hamilton, Ontario.

Dr. Douglas E. Busby, 1807 Washington N.W., Albuquerque, New Mexico, U.S.A., interned at Victoria Hospital and is presently associated with the Department of Aerospace Medicine and the Lovelace Foundation in Albuquerque, New Mexico. He is married and has three daughters.

Dr. James M. Campbell, 309 Lancaster Ave., Kitchener, Ontario, interned at St. Joseph's Hospital, London and is now in general practice in Kitchener. He married Mary Francis Richardson (B.ScN '56) and they have two sons.

Dr. John H. Collins, 8 Briar Hill Place, London, Ontario, interned and did postgraduate training in Obstetrics and Gynecology at Victoria Hospital, London, Ontario. He received his F.R.C.S. (Ob.-Gyn.) in 1965 and is now in England doing further postgraduate study. He is married and has three children.

Dr. John B. Dalton, 15 Parkview Drive, Peterborough, Ontario, interned at Harper's Hospital, Detroit, and did postgraduate study in Internal Medicine in the same hospital. He has his certification in Internal Medicine and is at present in private practice in Peterborough.

Dr. James F. Dixon, 20 Sumner Rd., London, Ontario, interned at Victoria Hospital, London, and did postgraduate training in Internal Medicine at Westminster Hospital and in Radiology at Victoria Hospital. He is married and has three children.

Dr. Vladimir Drkulec, 923 Victoria, Windsor, Ontario, is in private practice in Windsor.

Dr. Elwood Dunn, 49 Windsor Crescent, Sudbury, Ontario, interned at Victoria Hospital, and is now in private practice in Sudbury. He is married and has one son.

Dr. Cameron S. Duthie, 77 Westmount St., Guelph, Ontario, interned at Hamilton General Hospital. He is in private practice in Guelph.

Dr. Wm. C. Farrington, 58 Dundonald St., Barrie, Ontario, interned at Hamilton General Hospital, and is in general practice in Barrie. He is married and has four children.

Dr. Kerry G. Ferguson, 804 Kipp's Lane, London, Ontario, interned at Victoria Hospital, and is now doing postgraduate training in Internal Medicine at Westminster Hospital, London. He is married and has two sons.

Dr. Kenneth J. Foster, 27 Brenton Rd., Saginaw, Michigan, U.S.A., interned at Mount Carmel Hospital, Detroit, and is now in private practice as an anaesthesiologist in Saginaw, Michigan. He is married and has one son.

Dr. Wm. Allen Frishette, 2275 South Circle Drive, Ann Arbour, Michigan, U.S.A., interned at St. Joseph's Hospital, London, and is currently doing postgraduate work in Pathology at the University of Michigan. He is married and has two children.

Dr. Robert B. Gledhill, c/o Montreal General Hospital, Orthopaedic Department, Montreal 25, Quebec, interned at the Montreal General Hospital, and is at present doing postgraduate training in Orthopaedics at the same hospital.

Dr. Alexander Graham, 47 Briar Hill Rd., Chatham, Ontario, interned at Montreal General Hospital. He is married and has a son and a daughter.

Mrs. Donald M. Graham (V. Carolyn Graham), 395 Wharncliffe Rd. N., London, Ontario, interned at Victoria Hospital and has done postgraduate study in Internal Medicine at Victoria Hospital and at Toronto General Hospital. At present, she is working with Dr. Burton in the Department of Biophysics at U.W.O.

Dr. G. Gary Gunn, 20 Sarington Ave., Buffalo, New York, U.S.A., interned at Harper's Hospital in Detroit. He did postgraduate training in general surgery and is now Chief Resident in surgery at E. J. Meyer Memorial Hospital in Buffalo and an Instructor in Surgery at the University of Buffalo. He is married and has one son.

Dr. Robert Hansebout, c/o Montreal Neurological Institute, 3801 University St., Montreal 2, Quebec, interned at Montreal General Hospital and did postgraduate study at the Montreal Neurological Institute. He received a M.Sc. in Neuropathology from McGill in 1965 for his research in cancer chemotherapy.

Dr. Robert Harwood, 28b Arwood Rd., London, Ontario, interned at Victoria Hospital, London and is now doing postgraduate work in Radiology at Victoria. He is married and has three children.

Dr. Robert Gordon Heckadon, 23 Thorncliffe Park Drive, Toronto 17, Ontario, interned at Toronto General Hospital and is now doing postgraduate study in plastic surgery at the same hospital. He is married and has one child.

Dr. Harold R. Hutchings lives at 217 Oxford St. W., London, Ontario. After three years of general practice in London, Ontario, he joined G. D. Searle & Co. of Canada Ltd., as Medical Associate in 1964. In 1965 he was appointed Medical Director of the same company, where he will be supervising research and investigations related to new pharmaceutical products. He is married and has one daughter.

Dr. William G. Jamieson, 16 Lyndhurst Place, London, did postgraduate work at Victoria Hospital, London and received his F.R.C.S. (Surgery) in 1965. He has just gone to London, England where he will spend two more years in postgraduate studies.

Dr. James W. Johnson, 2581 McClintock Road, Pontiac, Michigan, interned at St. Joseph's Hospital, London and thereafter studied child psychiatry at the Lafayette Clinic in Detroit. He is presently director of child psychiatry at Fairlawn Centre in Pontiac. He and his wife Janet have one daughter.

Dr. Paul Roswell Kipp, 36264 Woodingham, Mt. Clemens, Michigan-48043, is presently practicing in Mt. Clemens as an obstetrician-gynecologist. His wife is the former Barbara Ann Erickson. They have three children.

Dr. Peter O. A. Kursell, 415 West Street, Simcoe, Ontario is in general practice in Simcoe. He is married and has one son.

Dr. C. Larry Leatherdale, Box 220, Port Burwell, interned at Hamilton General Hospital. He is married and has a son and a daughter.

Dr. Gordon M. LeBoldus, 699 Butler Avenue, London, Ontario ,interned at St. Joseph's Hospital, London and did postgraduate work in Otolaryngology at the Henry Ford Hospital, Detroit. He received his F.R.C.S. (Otolaryngology) in 1965 and is now in private practice in London. He is married and has two children.

Dr. I. Donald MacKay, 7169 Polk, Taylor, Michigan.

Captain James A. McKillop, address unknown, interned at Victoria Hospital, London and then was resident at Westminster Hospital.

Dr. James W. McLean, 2 Milepost Pl., Apt. 209, Toronto 17, did postgraduate work at Toronto General Hospital and received his F.R.C.S. (Otolaryngology) in 1965.

Dr. Gordon R. McPherson, Box 1119, Amherstburg, interned at St. Joseph's Hospital, London and is now in general practice. He married Mary Eleen Arnold, (A '57).

Dr. D. Ross McTavish, Wellesley Hospital, Toronto 5, Ontario, is doing postgraduate work in surgery in Toronto.

Dr. William C .Maddeford, 599 Cheapside St., London, Ontario is in general practice in London.

Dr. John S. Madronich, 60 Buckingham Drive, Hamilton, Ontario, received an award in May, 1962 from the C.N.I.B. for postgraduate study in ophthalmology. He received his certification in ophthalmology this past year.

Dr. Donald G. Nasser, Sunnybrook Hospital, Toronto 12, Ontario, did postgraduate work at the Ontario Hospital in St. Thomas and the Toronto Psychiatric Hospital.

Dr. Donald M. Noble, P.O. Box 639, Ajax, Ontario, interned at St. Joseph's Mercy Hospital in Ann Arbour. He is married to the former Eleanor Swan (Bus. '51) and they have twins, a boy and a girl.

Dr. Glen L. Oliver, 8 Whittier Place, Charles River Park, Boston, Mass., interned at Victoria Hospital, London and did postgraduate study at the University Hospital, Edmonton, Alberta. He is married and has one daughter.

Dr. Ronald B. Passi, interned at Victoria Hospital, London and remained in London for postgraduate work in surgery. He was awarded an F.R.C.S.(C) in 1965. He and his wife Nancy have a son and a daughter.

Dr. Glenn Thomas Renecker is presently at Royal Victoria Hospital, Montreal, P.Q.

Dr. Robert D. Sheppard, 29 Church St., St. Catharines, Ontario.

Dr. John E. Smart, Box 440, Waterdown, Ontario is married and has two sons.

Dr. G. Warren Squire, address unknown, interned at Victoria Hospital, London and later did postgraduate work at Toronto Western Hospital and Sunnybrook Hospital, Toronto. In September, 1965, he accepted a position at the University of Lagos Teaching Hospital, Lagos, Nigeria. He was married in 1963.

Dr. Melvin D. Steinhart, 670 Dorchester, Kingston, Ontario, married Ruth Ann Siegel, Arts '58. They have a son and daughter.

Dr. Gilbert L. Stewart, 309 Lancaster W., Kitchener, Ontario.

Dr. Robert Kenneth Stuart, 93 Pierce Rd., Fairfield Gardens, Watertown 72, Mass., U.S.A.

Dr. John J. Theoret, 230 Baseline Road, London, Ontario, interned at Hamilton General Hospital and is presently in general practice in London. He and his wife June have three children.

Dr. John E. A. Tyson, 135 Union St., #108, Simcoe, Ontario interned at Hamilton General Hospital. He returned to London in 1961 and did postgraduate work in the Department of Physiology, U.W.O. and at Westminster Hospital, London.

Dr. Ralph Williamson, 2250 Bonair Place S.W., Seattle, Washington 98116, married Sandra Jean Maxwell (A. '57). They have one son.

Dr. David Wilson, 18 Derivent Avenue, Brampton, Ontario, interned at Toronto Western Hospital and later was resident at Sunnybrook Hospital. He married Marilyn Louise Haufschild (A '60) and they have a son and a daughter.

Dr. V. Cecil Wright, 313 LaSalle Avenue, Buffalo, N.Y., interned at Victoria Hospital, London, and did postgraduate training at New York State University, Buffalo, N.Y. He received his certification in Obstetrics and Gynecology in 1965. He is married and has two daughters.